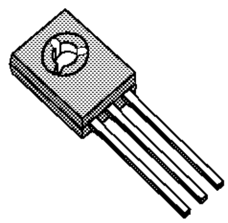
TDA1151

MOTOR SPEED REGULATOR

- EXCELLENT VERSATILITY IN USE
- HIGH OUTPUT CURRENT (UP TO 800mA)
- LOW QUIESCENT CURRENT (1.7mA)
- LOW REFERENCE VOLTAGE (1.2V)
- EXCELLENT PARAMETERS STABILITY VERSUS TEMPERATURE



ORDERING NUMBER : TDA1151

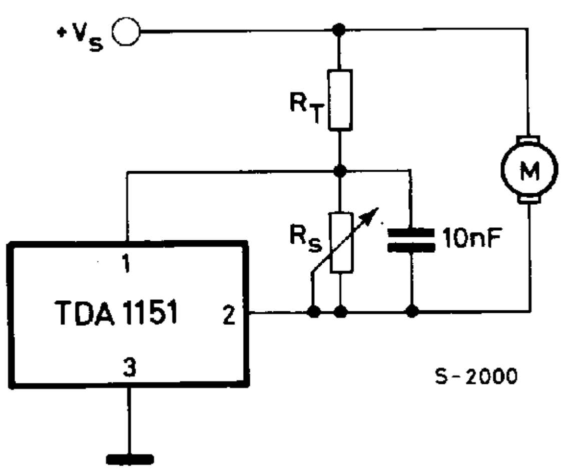
DESCRIPTION

The TDA1151 is a monolithic integrated circuit in SOT-32 plastic package. It is intended for use as speed regulator for DC motors of record players, tape and cassette recorders, movie cameras, toys etc.

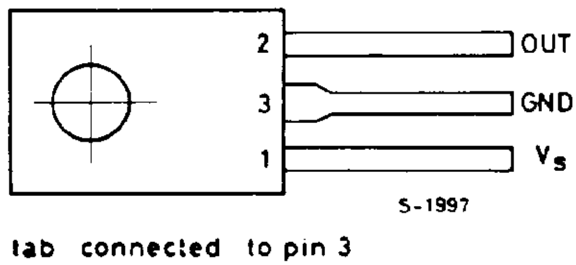
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_s	Supply voltage	20	V
P_{tot}	Total power dissipation at T_{amb} = 70°C	0.8	W
	at T_{case} = 100°C	5	W
T_{stg}, T_j	Storage and junction temperature	-40 to 150	°C

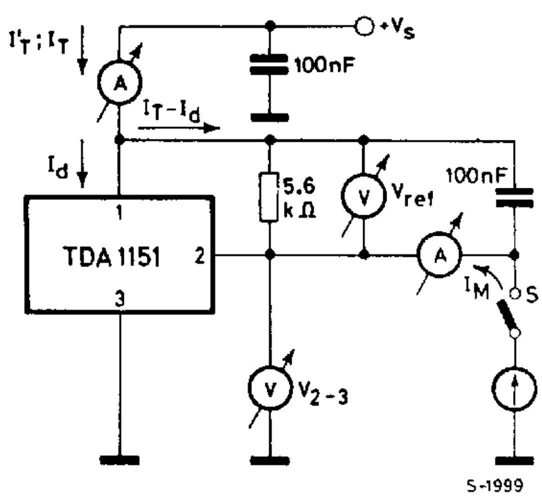
APPLICATION CIRCUIT



CONNECTION DIAGRAM



TEST CIRCUIT



THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	10	°C/W
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	100	°C/W

ELECTRICAL CHARACTERISTICS (Refer to the test circuit, T_{amb} = 25 °C)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_{ref}	Reference voltage (between pins 1 and 2)	V_s = 6V I_M = 0.1A	1.1	1.2	1.3	V
I_d	Quiescent drain current	V_s = 6V I_M = 100 μA		1.7		mA
I_{MS}	Starting current	V_s = 5V $\Delta V_{ref}/V_{ref}$ = -50%	0.8			A
$V_{1\text{-}3}$	Minimum supply voltage	I_m = 0.1 A $\Delta V_{ref}/V_{ref}$ = -5%			2.5	V
$K=I_m/I'_T$	Reflection coefficient	V_s = 6V I_M = 0.1A	18	20	22	
$\frac{\Delta K}{K} / \Delta V_s$		V_s = 6V to 18V I_m = 0.1A		0.45		%/V
$\frac{\Delta K}{K} / \Delta I_M$		V_s = 6V I_m = 25 to 400 mA		0.005		%/mA
$\frac{\Delta K}{K} / \Delta T$		V_s = 6V I_m = 0.1A T_{amb} = -20 to 70°C		0.02		%/°C
$\frac{\Delta V_{ref}}{V_{ref}} / \Delta V_s$	Line regulation	V_s = 6V to 18V I_M = 0.1A		0.02		%/V
$\frac{\Delta V_{ref}}{V_{ref}} / \Delta I_M$	Load regulation	V_s = 6V I_m = 25 to 400 mA		0.009		%/mA
$\frac{\Delta V_{ref}}{V_{ref}} / \Delta T$	Temperature coefficient	V_s = 6V I_m = 0.1A T_{amb} = -20 to 70°C		0.02		%/°C

Figure 1. Quiescent drain current vs. power supply

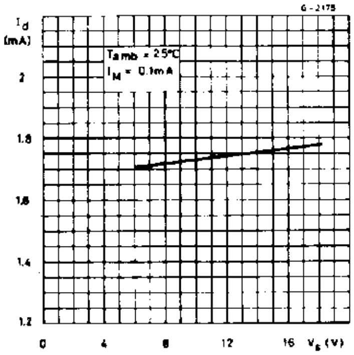


Figure 2. Quiescent drain current vs. ambient temperature

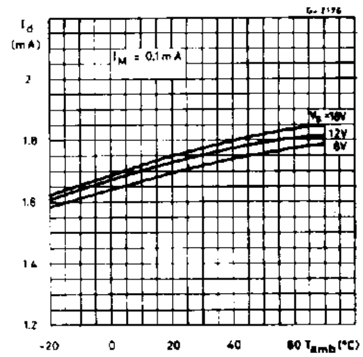


Figure 3. Reference voltage vs. supply voltage

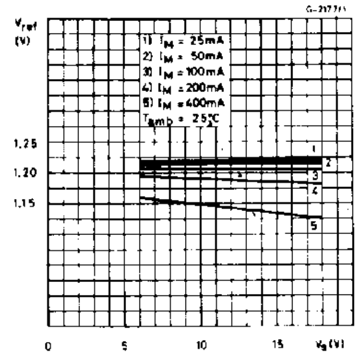


Figure 4. Reference voltage vs. motor current

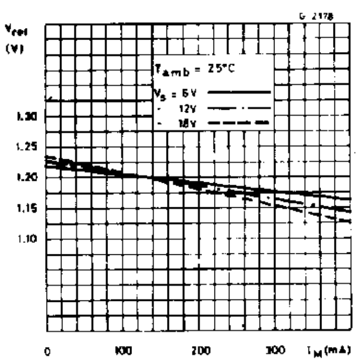


Figure 5. Reference voltage vs. ambient temperature

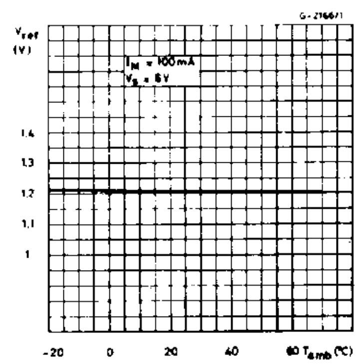


Figure 6. Reflection coefficient vs. supply voltage

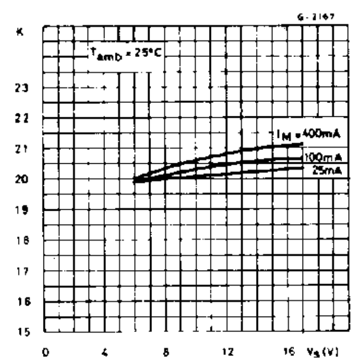


Figure7. Reflection coefficient vs. motor current

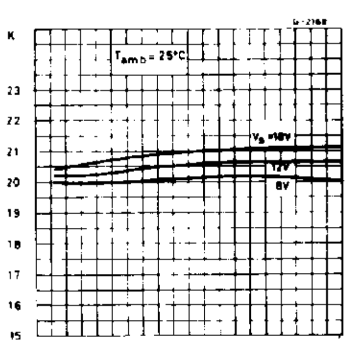


Figure 8. Reflection coefficient vs. ambient temperature

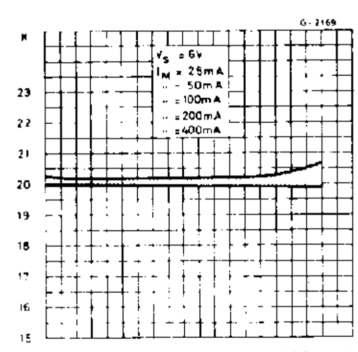


Figure 9. Typical minimum supply voltage vs. motor current

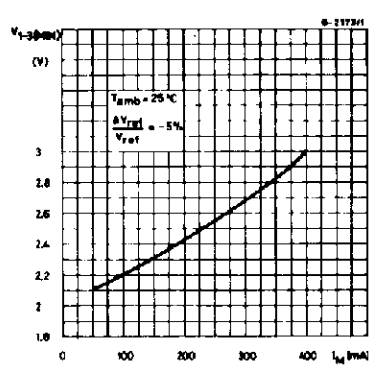
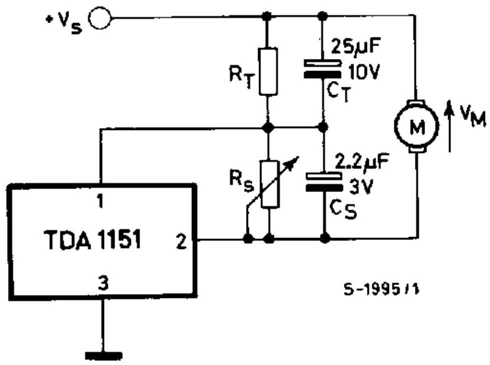


Figure 10. Application circuit



$V_S = +9V$
$R_M = 14.2\Omega$
$R_T = 280\Omega$
$R_S = 1\ k\Omega$
$E_g = 2.9V$
$I_M = 150\ mA$
$V_M = R_M \bullet I_M + E_g = 5.03V$

Note: A ceramic capacitor of 10 nF between pins, 1 and 2 improves stability in some applications.

Figure 11. P.C. board and component layout of the circuit of Fig. 10 (1 : 1 scale)

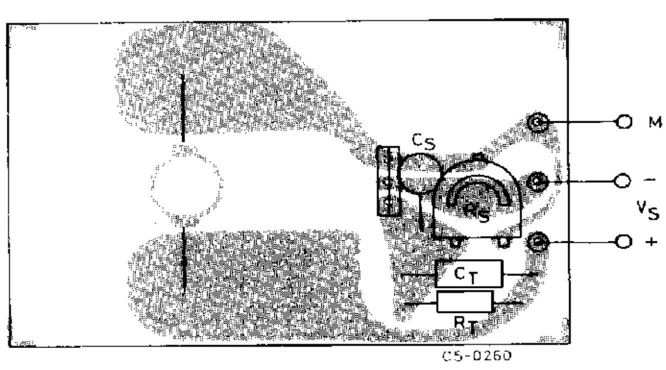


Figure 12. Speed variation vs. supply voltage

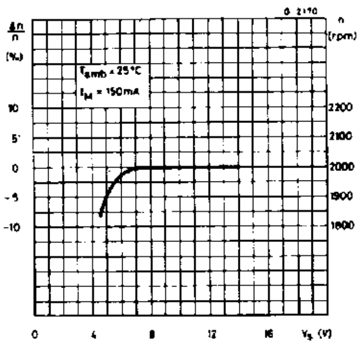


Figure 13. Speed variation vs. motor current

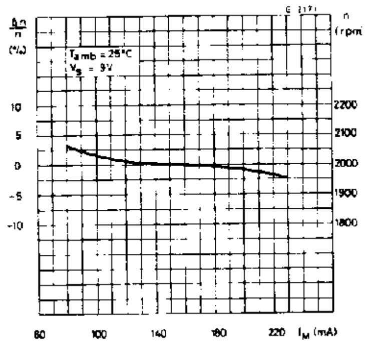


Figure 14. Speed variation vs. ambient temperature

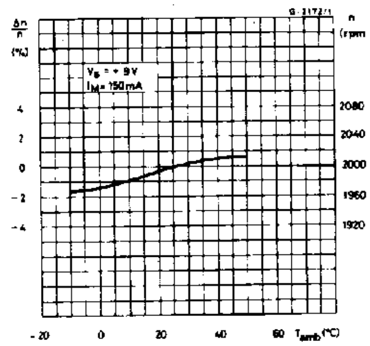


Figure 15. Low cost application circuit

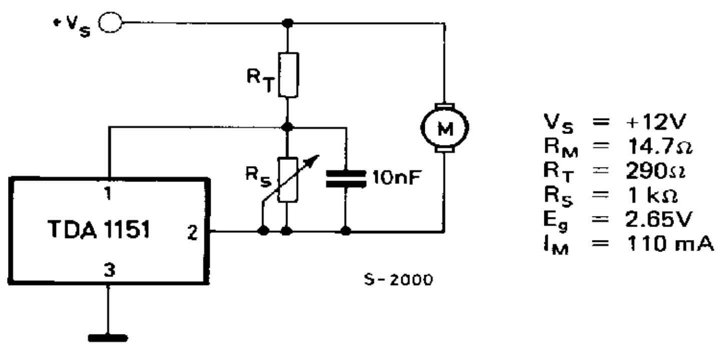


Figure 16. Speed variation vs. supply voltage

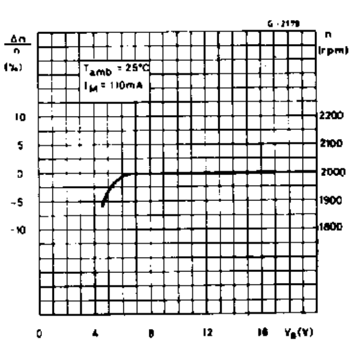


Figure 17. Speed variation vs. motor current

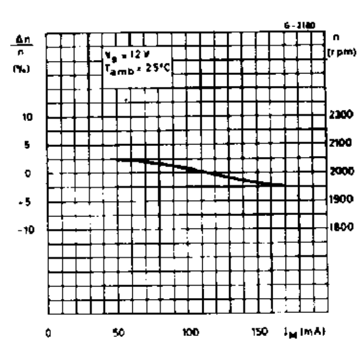
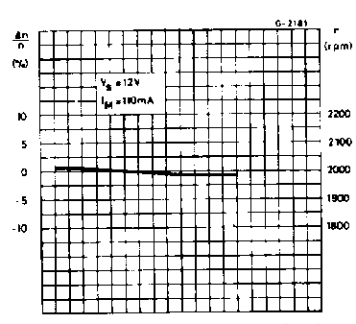


Figure 18. Speed variation vs. ambient temperature



SOT-32 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	7.4		7.8	0.291		0.307
B	10.5		10.8	0.413		0.425
b	0.7		0.9	0.028		0.035
b1	0.49		0.75	0.019		0.030
C	2.4		2.7	0.094		0.106
c1		1.2			0.047	
D		15.7			0.618	
e		2.2			0.087	
e3		4.4			0.173	
F		3.8			0.150	
G	3		3.2	0.118		0.126
H			2.54			0.100

